MDO Test Suite on the World Wide Web

by

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Outline

- Motivation for Test Suite
- Advantage of WWW Implementation
- Sample Web Pages and Test Problems
- Plans for the Future

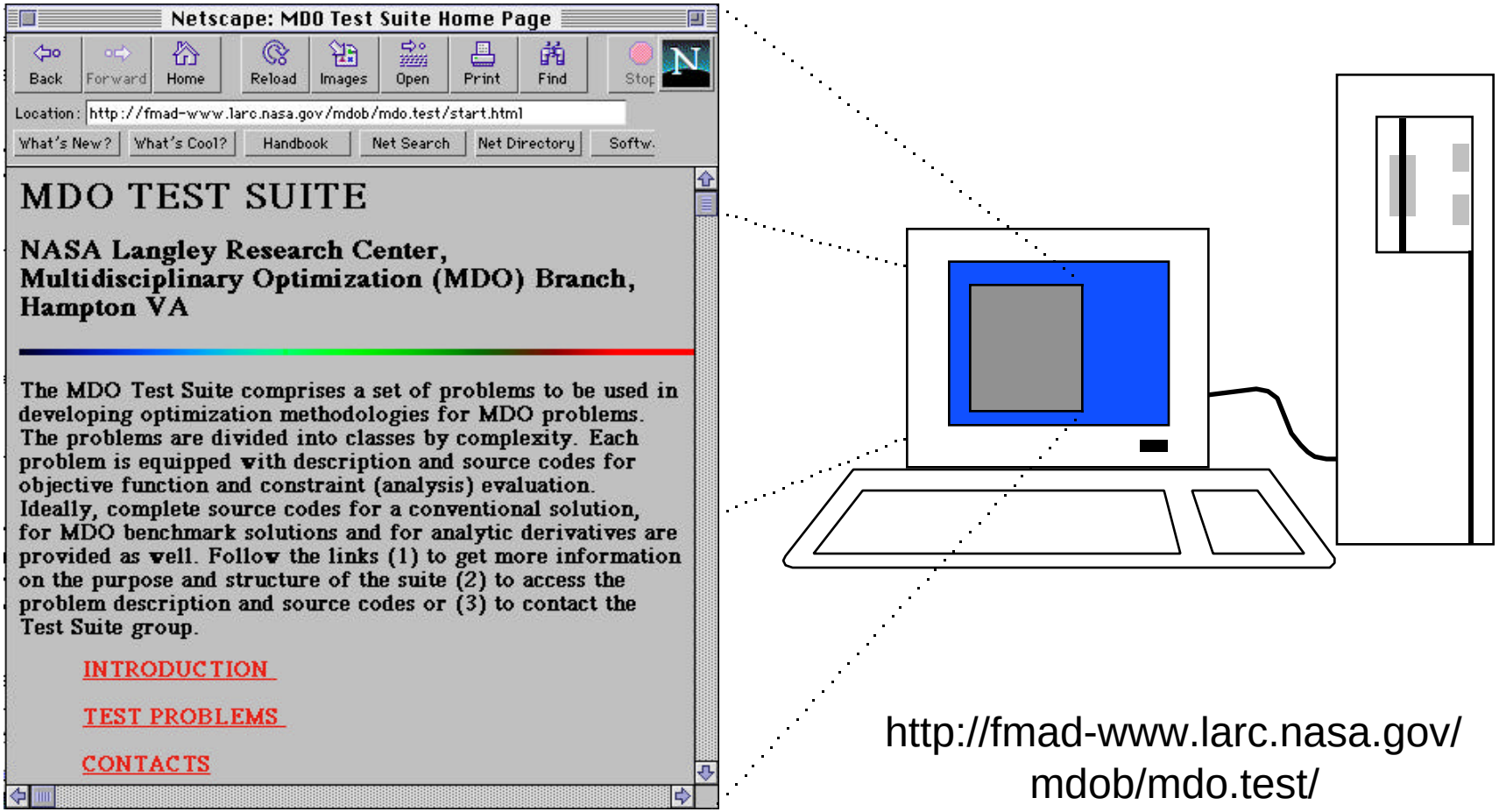
Why an MDO Test Suite?

- To compare, evaluate and categorize MDO methods
- To complement our research publications
- To challenge the experts

Advantages of WWW

- Available 24 hour/day
- Hypertext hides details until needed
- Frequent updates and additions
- Electronic feedback from users

MDO Test Suite on the World Wide Web

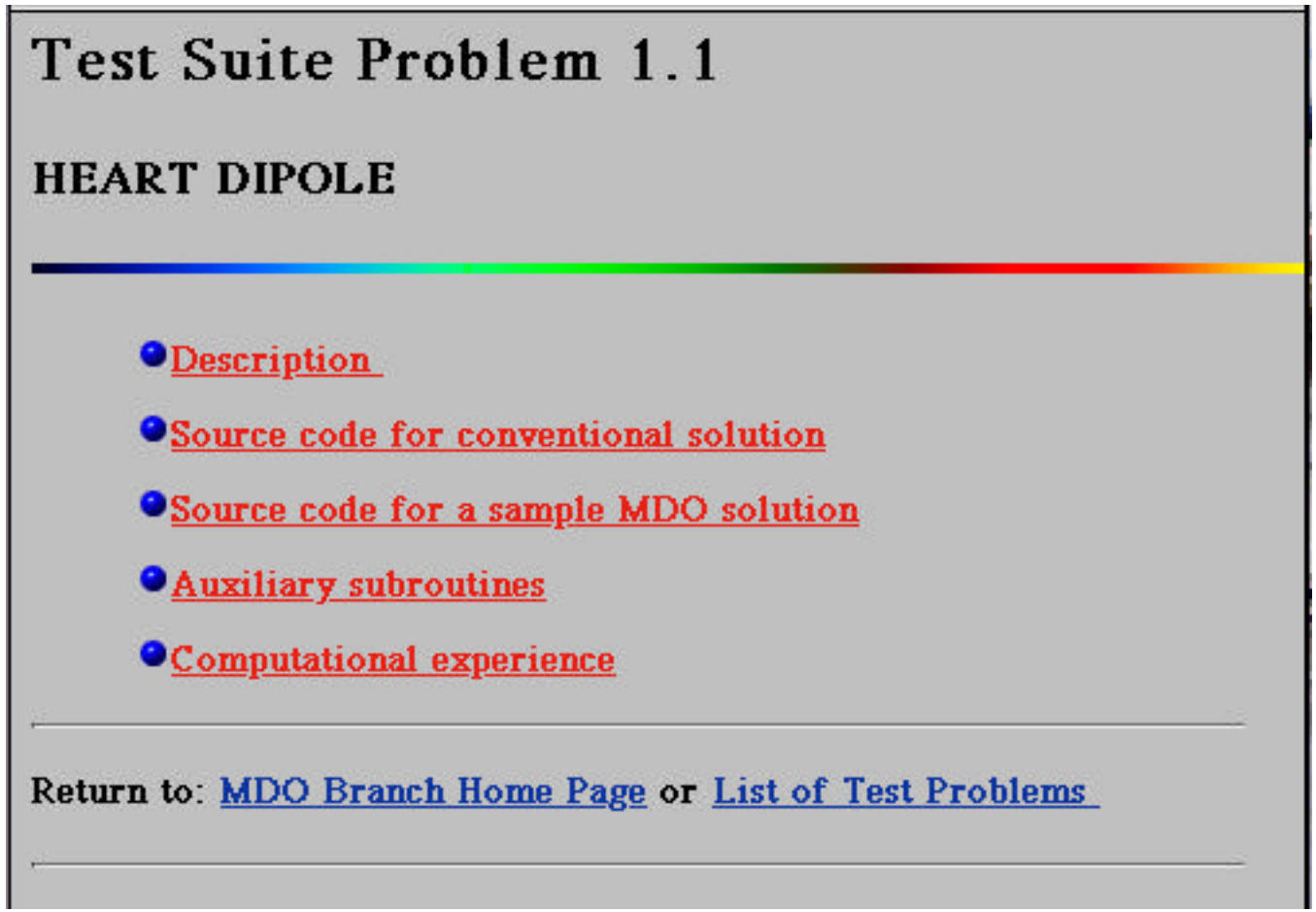


http://fmad-www.larc.nasa.gov/mdob/mdo.test/

List of Test Problems

PROBLEM	**DISCIPLINES**		
Heart Dipole			
Hub Design	Structures		
Electronic Packaging	Thermal	Circuit Design	
Speed Reducer	Structures	Mechanics	
Power Converter	Electronics		
Rule-based Design	Performance		
Supersonic Aircraft	Structures	Aerodynamics	Performance
Damper Placement	Structures		

Sample Web Page

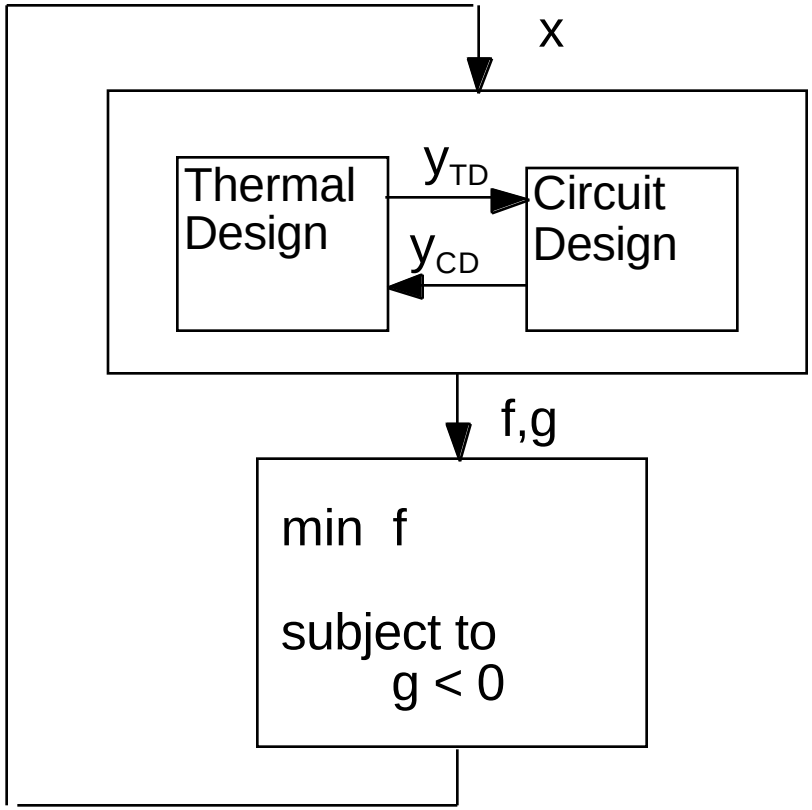


Characteristics of Test Problems

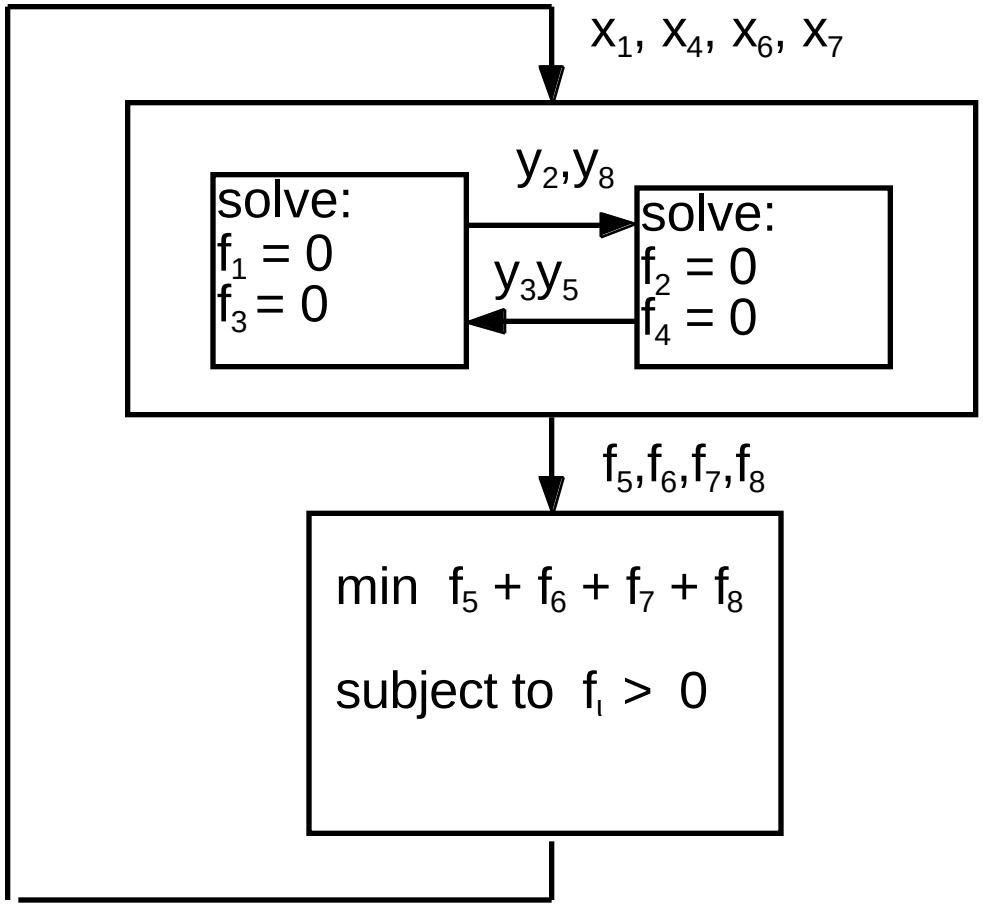
PROBLEM	NO. OF DESIGN VAR.	NO. OF CONSTRAINTS	NOTES
Heart Dipole	8	8	algebraic eqs.
Electronic Pack.	8	3	
Hub Design	adjustable	adjustable	parallel code
Speed Reducer	7	11	multi-level
CASCADE	many	many	eqs. generator
Approx. Opt.	25	68	response surface
Supersonic *	44	300	GSE & database
Damper Place.	1507	11	integer d. v.

* source code not available outside USA

Electronic Packaging Problem



Heart Dipole Problem



Try It Yourself!

- Use your favorite web browser
- Search for “MDO”
- Browse test problems
- Save source code to a file
- Use our guest books

New Test Problems Sought

- Recent graduates can “advertise”
- Industry can guide future research
- Anyone can archive favorite problems:
  - Use existing test problem as a template
  - Save HTML to a file
  - Edit with any text editor
  - Test pages locally, then e-mail me a URL

Prototype Test Suite Open Issues

- Standards
  - WEBLINT checks HTML syntax
  - Coding standards available
- Feedback Mechanisms
  - Each problem has a guestbook
  - Test suite developers available via e-mail
- Maintenance Issues
  - NASA tests each code on its workstations
  - Experience of others collected in guestbook

Concluding Remarks

- MDO community needs test suite to evaluate products of MDO research
- WWW-based prototype test suite available at NASA Langley
- Use of test suite is encouraged; see http://fmad-www.larc.nasa.gov/mdob/
- New test problems are sought